

WHAT IS CLAIMED IS:

1 1. An isolated nucleic acid encoding an estrogen-regulated
2 unconventional myosin-related protein, said protein having at least one of the following
3 characteristics:

4 (1) comprising at least about 70% amino acid sequence similarity to a
5 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6; or

6 (2) specifically binding to polyclonal antibodies generated against a
7 polypeptide comprising an amino acid sequence selected from the group consisting of
8 SEQ ID NOs: 1, 4 and 6.

1 2. The nucleic acid of claim 1, wherein said protein is at least about
2 70% identical to a sequence selected from the group consisting of SEQ ID NOs:1, 4, and
3 6.

1 3. The nucleic acid of claim 1, wherein said nucleic acid encodes a
2 protein comprising an amino acid sequence selected from the group consisting of SEQ ID
3 NOs: 1, 4 and 6.

1 4. The nucleic acid of claim 1, wherein said nucleic acid comprises a
2 nucleotide sequence that is at least about 70% similar to a sequence selected from the
3 group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1 5. The nucleic acid of claim 4, wherein said nucleic acid comprises a
2 nucleotide sequence that is at least about 70% identical to a sequence selected from the
3 group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1 6. The nucleic acid of claim 4, wherein said nucleic acid comprises a
2 nucleotide sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1 7. The nucleic acid of claim 1, wherein said nucleic acid hybridizes
2 under moderately stringent wash conditions to a nucleic acid comprising a nucleotide
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1 8. The nucleic acid of claim 7, wherein said nucleic acid hybridizes
2 under stringent wash conditions to a nucleic acid comprising a nucleotide sequence
3 selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

- 1 9. The nucleic acid of claim 1, wherein said nucleic acid is from a
2 mouse.
- 1 10. An expression cassette comprising the nucleic acid of claim 1.
- 1 11. An isolated eukaryotic cell comprising the expression cassette of
2 claim 10.
- 1 12. An isolated estrogen-regulated unconventional myosin-related
2 protein, said protein having at least one of the following characteristics:
3 (1) comprising at least about 70% amino acid sequence similarity to a
4 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6; or
5 (2) specifically binding to polyclonal antibodies generated against a
6 polypeptide comprising an amino acid sequence selected from the group consisting of
7 SEQ ID NOs: 1, 4 and 6.
- 1 13. The protein of claim 12, wherein said protein comprises at least
2 about 70% amino acid sequence identity to a sequence selected from the group consisting
3 of SEQ ID NOs: 1, 4 and 6.
- 1 14. The protein of claim 12, wherein said protein comprises an amino
2 acid sequence selected from the group consisting of SEQ ID NOs: 1, 4 and 6.
- 1 15. The protein of claim 12, wherein said protein is from a mouse or a
2 human.
- 1 16. An antibody that selectively binds to the estrogen-regulated
2 unconventional myosin-related protein of claim 12.
- 1 17. A method of modulating the effects of estrogen in a mammalian
2 cell, said method comprising modulating the level of expression or activity of the
3 estrogen-regulated unconventional myosin-related protein of claim 12 in said cell.
- 1 18. The method of claim 17, wherein said level of expression of said
2 estrogen-regulated unconventional myosin-related protein is modulated by introducing a
3 polynucleotide into said cell, whereby the presence or expression of said polynucleotide

modulates said level of expression of said estrogen-regulated unconventional myosin-related protein.

19. The method of claim 18, wherein said polynucleotide encodes a full-length estrogen-regulated unconventional myosin-related protein of claim 12, and wherein expression of said polynucleotide increases said level of expression of said estrogen-regulated unconventional myosin-related protein.

20. The method of claim 18, wherein said polynucleotide is an antisense sequence, and wherein the presence or expression of said polynucleotide decreases said level of expression of said estrogen-regulated unconventional myosin-related protein.

21. The method of claim 17, wherein a compound is administered to said cell, whereby said level of said expression or activity of said estrogen-regulated unconventional myosin-related protein is modulated.

22. The method of claim 17, wherein said effects of estrogen are mediated by an estrogen receptor α .

23. The method of claim 17, wherein said effects of estrogen are mediated by an estrogen receptor β .

24. The method of claim 17, wherein said cell is present in a mammal.

25. The method of claim 24, wherein said level of expression or activity of said estrogen-regulated unconventional myosin-related protein is increased, whereby the development of atherosclerosis or osteoporosis in said mammal is inhibited.

26. The method of claim 24, wherein said level of expression or activity of said estrogen-regulated unconventional myosin-related protein is decreased, whereby the development of breast cancer in said mammal is inhibited.

27. A method of detecting the presence of estrogen signaling in a mammalian cell, the method comprising detecting the expression of the nucleic acid of claim 1 in the cell.

1 28. The method of claim 27, wherein said presence of estrogen
2 signaling in said cell is used in order to determine the responsiveness of said cell to
3 estrogen.

1 29. The method of claim 27, wherein said presence of estrogen
2 signaling in said cell is used in order to determine the tissue-specific distribution of
3 estrogen signaling in a mammal.

1 30. The method of claim 27, wherein said estrogen signaling is
2 mediated by an estrogen receptor α .

1 31. The method of claim 27, wherein said expression of said nucleic
2 acid in said cell is detected by detecting the expression or activity of the protein of claim
3 12 in said cell.

1 32. The method of claim 27, wherein said expression of said nucleic
2 acid in said cell is detected by detecting the level of estrogen-regulated unconventional
3 myosin mRNA in said cell.

1 33. A method of identifying a compound capable of acting as an
2 estrogen-receptor agonist or antagonist, the method comprising:
3 (1) contacting a cell comprising an estrogen receptor with said compound;
4 and
5 (2) detecting the functional effect of said compound on said cell,
6 wherein an increase in the level of estrogen regulated unconventional
7 myosin-related mRNA, protein, or protein activity in said cell indicates that said
8 compound is capable of acting as an estrogen receptor agonist, and wherein an decrease
9 in the level of estrogen regulated unconventional myosin-related mRNA, protein, or
10 protein activity in said cell indicates that said compound is capable of acting as an
11 estrogen receptor antagonist.

1 34. The method of claim 33, wherein said estrogen receptor is an
2 estrogen receptor α .

1 35. The method of claim 33, wherein said estrogen receptor is an
2 estrogen receptor β .

1 36. The method of claim 33, wherein said estrogen-regulated
2 unconventional myosin-related mRNA is at least about 70% similar to a nucleotide
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1 37. The method of claim 36, wherein said estrogen-regulated
2 unconventional myosin-related mRNA is at least about 70% identical to a nucleotide
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1 38. The method of claim 33, wherein said estrogen-regulated
2 unconventional myosin-related protein is at least about 70% similar to an amino acid
3 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6.

1 39. The method of claim 38, wherein said estrogen-regulated
2 unconventional myosin-related protein is at least about 70% identical to an amino acid
3 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6.